

# Biological and Environmental Research

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U.S. DEPARTMENT OF  
**ENERGY**

Office  
of Science

Office of Biological  
and Environmental Research

# Office of Science

## Science to Meet the Nation's Challenges Today and into the 21<sup>st</sup> Century

### The Frontiers of Science

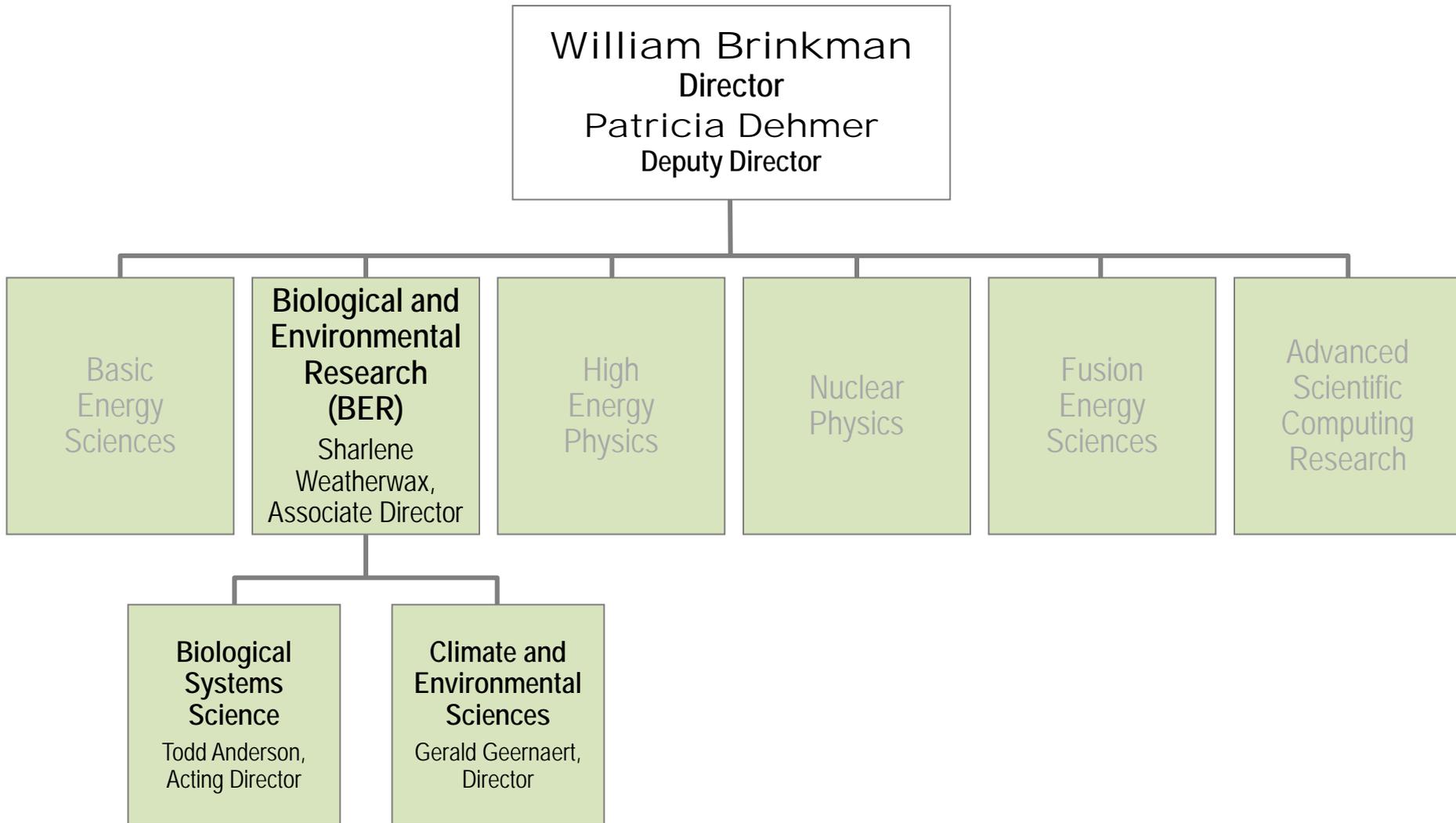
- Supporting research that led to over 100 Nobel Prizes during the past 6 decades—22 in the past decade alone
- Providing 45% of Federal support of basic research in the physical sciences and key components of the Nation's basic research in biology and computing
- Supporting over 27,000 Ph.D.s, graduate students, undergraduates, engineers, and support staff at more than 300 institutions

### 21<sup>st</sup> Century Tools of Science

- Providing the world's largest collection of scientific user facilities to over 26,000 users each year

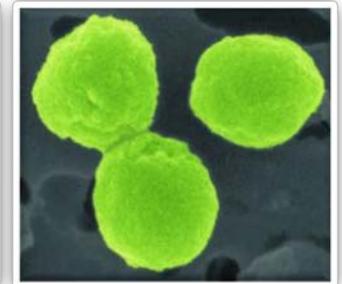
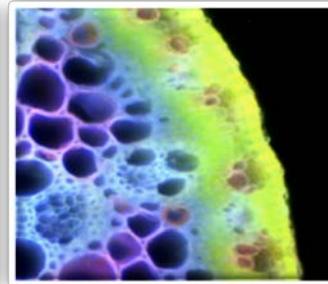
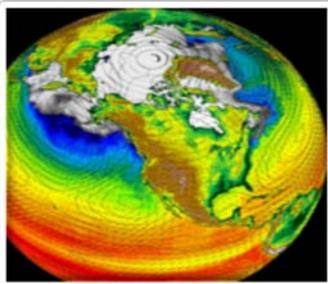


# Department of Energy Office of Science



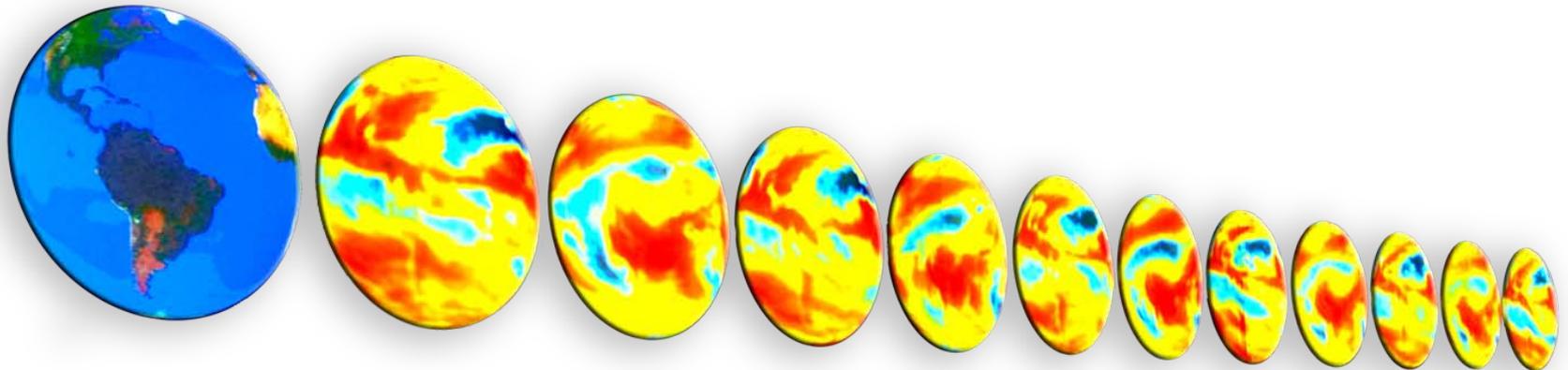
# Biological and Environmental Research Mission

- To understand complex biological, climatic, and environmental systems across spatial and temporal scales.
- BER provides the foundational science to:
  - Support the development of biofuels as major, secure, and sustainable national energy resources
  - Understand the potential effects of greenhouse gas emissions on Earth's climate and biosphere and the implications of these emissions for our energy future
  - Predict the fate and transport of contaminants in the subsurface environment at DOE sites
  - Develop new tools to explore the interface of biological and physical sciences



# Biological and Environmental Research Approach

- Understanding complex biological and environmental systems across many spatial and temporal scales:
  - From the sub-micron to the global
  - From individual molecules to ecosystems
  - From nanoseconds to millennia
- Integrating science by tightly coupling theory, observations, experiments, models, and simulations
- Supporting interdisciplinary research to address critical national needs
- Engaging national laboratories, universities, and the private sector to generate the best possible science



# Why DOE?

## The Energy-Climate Nexus

Greenhouse gases are emitted during energy production...  
and climate change will impact energy production

DOE seeks to:

- Understand the effects of GHG emissions on Earth's climate and the biosphere
- Provide world-leading capabilities in climate modeling and process research on clouds and aerosols, and the carbon cycle
- Provide unique, world-leading capabilities in cloud and aerosol observations and large scale ecological experiments
- Build foundational science to support effective energy and environmental decision making

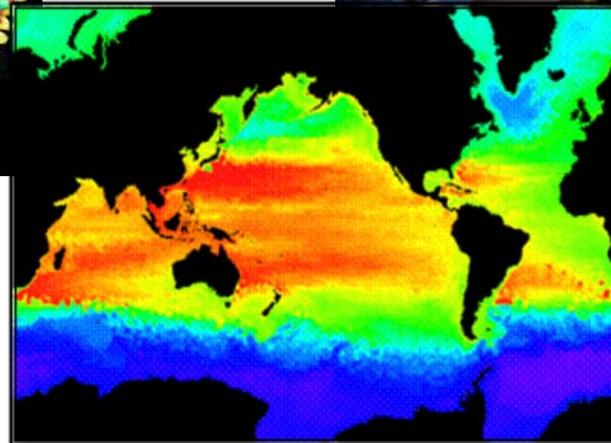
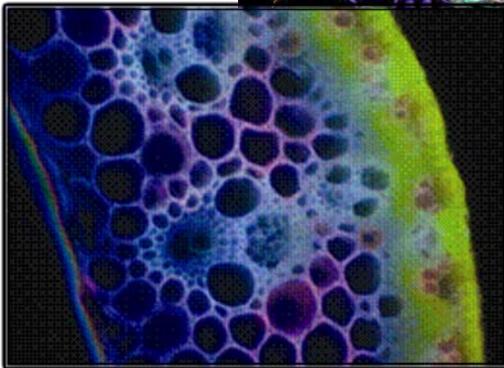
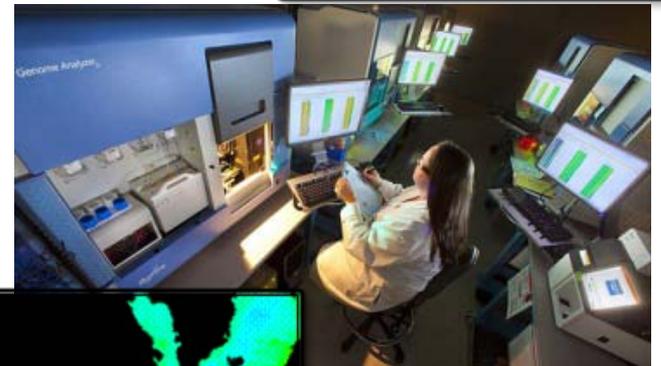
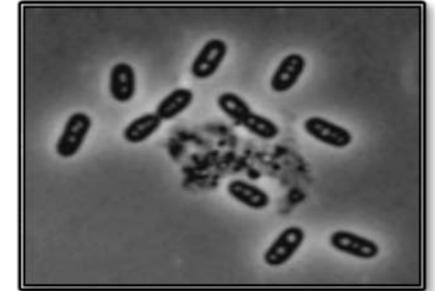


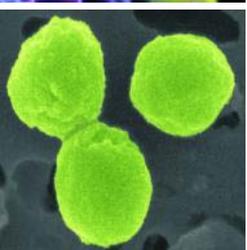
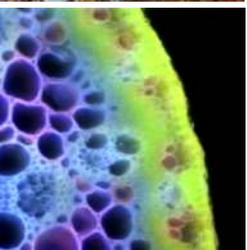
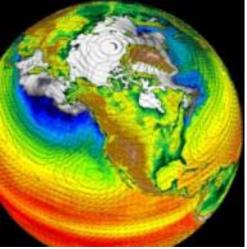
# Biological and Environmental Research

Appropriations		FY 11	FY 12 Request
Research	Biological Systems Science	\$223M	\$276M
	Climate Change Research	\$106M	\$104M
	Environmental Systems Science	\$80M	\$101M
	<b>Total</b>	<b>\$409M</b>	<b>\$481M</b>
Facilities: Scientific User Facility Operations	Joint Genome Institute and Structural Biology Infrastructure	\$85M	\$90M
	ARM Climate Research Facility	\$46M	\$68M
	Environmental Molecular Sciences Laboratory (EMSL)	\$51M	\$56M
	<b>Total</b>	<b>\$182M</b>	<b>\$214M</b>
Other	Small Business Innovation Research, Data Management and Education, General Purpose Equipment, General Plant Projects	\$21M	\$23M
	<b>Total BER</b>	<b>\$612M</b>	<b>\$718M</b>

# Biological and Environmental Research

Systems science to meet DOE mission needs in bioenergy, climate and the environment.





# Thank you!

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<http://science.energy.gov/ber>



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